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BY

HUGH R. WATKIN,

June 14th, 1905.

Marshall

THE
DISCOVERY AND TRANSPORTATION
TO ST. PETERSBURG
OF THE
BEREZOVKA MAMOTH,

Translated and described in a Paper read before

The Torquay Natural History Society,

BY

HUGH R. WATKIN,

June 14th, 1905.

PREFACE.

WITH deep regret I heard from St. Petersburg in the autumn of 1905 of the loss to Science of Professor O. F. Hertz, who kindly supplied me with the printed report in the Russian language of his journey, and unique photographs taken by him of the Berezovka Mammoth *in situ*, as discovered. The beautiful reproduction of the Mammoth, just as it was found, and the adjoining mounted skeleton, in the Natural History Museum of the Imperial Academy of Science, are fitting monuments to the whole-hearted enthusiasm with which this ardent scientist undertook and accomplished a truly difficult task.

TORQUAY, July, 1906.

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THE DISCOVERY AND TRANSPORTATION TO ST. PETERSBURG OF THE BEREZOVKA MAMOTH.

IT may be thought that I have gone rather far afield for the subject of my paper this evening, the reasons for my selection are briefly these:—

Firstly,—When I obtained the published report of the expedition for the recovery of the Mamoth found on the bank of the Berezovka, I learnt that it had only been printed in the Russian, German and French languages, and although many brief notices were given in the English press, the only detailed account published in our language, as far as I can ascertain, is contained in the Smithsonian Reports for 1903, which have not yet reached the Library of this Society, and have therefore probably not come under the notice of members.

Secondly,—Having lived so many years among the Russian people I should like to state what a great pleasure it is to me to have the opportunity, so kindly afforded me by your presence here this evening, of drawing attention to what was really a stupendous scientific task carried out so ably by a Russian zoologist, one of a little band recognized by only a very small educated number of their countrymen, and naturally still less abroad, but who, despite the difficulties of Government and dark days which have come upon their country, work on in the search for scientific knowledge and, like the late Baron Toll and his ill-fated expedition, risk their lives if necessary in pursuit of fresh evidence and data which are slowly but surely unfolding the past history of the planet on which we live.

It is impossible in the short time at my disposal to read a translation of the report in full, but by means of extracts from that report, following the route of the expedition, we will, I hope, not only get a better idea of the immense difficulties undertaken and overcome in order to obtain *one* specimen for a Natural History Museum, but also get an insight from a naturalist's point of view of that great expanse of country forming part of Asiatic Russia known as Siberia.

ORIGIN OF EXPEDITION.

About the middle of April, 1901, the Imperial Academy of Sciences was informed by the Governor of Yakutsk, Vladimir Nicolaievitch Skripitsin, of the discovery of a Mammoth on the river Berezovka, a tributary on the right bank of the river Kolmy, about 300 versts N.E. of Srednaia Kolymsk. This Mammoth, according to the report of the Assistant Overseer of the district, N. L. Horn, and of the Cossack, I. Yavlovsky, was found in almost perfect preservation. Thanks to the interest shown by the Minister of Finance, C. I. Witte, the sum of R16,300 (£1,650) was promptly assigned for the fitting out of an expedition to the Berezovka as quickly as possible. The chief Zoologist of the Zoological Museum of the Imperial Academy of Sciences, O. F. Hertz, was appointed head of the expedition, and under him the Chief Taxidermist, E. V. Pfitzenmeyer, and the student of the Urieff University (formerly Dorpat), D. G. Sevastianoff, a geologist.

Some idea of the distance and extent of the Russian Empire may be gathered from the fact that the expedition had to traverse 125° longitude east from St. Petersburg, or rather more than one-third of the circumference of the Earth north of 60° latitude, without once quitting the Empire of the Tsar. On the 3rd May the expedition left St. Petersburg, travelling the 400 miles to Moscow, a night's journey by the Nicolai Railway. After two days' stop in Moscow they travelled by the Great Siberian Railway, crossing the Volga south of Samara, passing Ufa, Tcheliabinsk, Omsk, where the railway crosses the Irtysh, crossing the Ob and further on the great Enisei river at Krasnoiask, and finally reaching Irkutsk some three stations distant from the great Lake Baikal. At Irkutsk they remained from May 14th to 20th obtaining necessaries for the expedition and letters of recommendation to the authorities in Yakutsk.

Sevastianoff, the geologist, was delayed by illness in Krasnoiask, but caught them up at Yakutsk.

Two days were spent in the dusty journey across the Buriat Steppe to Katchuga, where they reached the upper waters of the great Lena river. From there they had, however, to drive in carts to Schigalovo, to obtain small boats to take them down the river to Ust Koota, which was as far up the river as the small steamer could get owing to low water. From there they were able to make an uninterrupted journey to Yakutsk, which they reached on the 14th June.

In his first letter Hertz does not hope to complete the outfitting of the expedition for at least a fortnight owing to the

apathetic character of the Yakouts, from which he could get nothing at first but promises. With the prospects before him of a 2,000 mile journey on horseback and on foot to Srednaia Kolymsk, through extremely poor country,—where he might go for 200 miles or more without meeting a soul,—much had to be foreseen and provided for.

Biscuits and dried meat had to be prepared, everything had to be put in packages as far as possible of uniform weight, securely stitched up in leather to keep out wet in crossing rivers. A blacksmith in Yakutsk had to be persuaded, when not drunk, to make the necessary tools for breaking the frozen ground. Hertz speaks highly of his workmanship. It is a sad physiological fact that the best artisans are so often the worst drunkards. An old merchant who had made the journey twice in summer time, evidently a record, advised them to take a light collapsible boat to serve as a tent, mosquito nets, glóves, makhalki (horses' tails) for driving off mosquitoes and flies, and numerous articles of barter.

Immediately on arrival in Yakutsk, Hertz sent on a Cossack in advance to arrange where possible to have post horses ready. Owing to the approaching fair in August horses could not be got at anything like reasonable prices. As guide he engaged a Cossack, and as interpreter a Yakout teacher, both natives of Kolymsk, the latter accompanied Tchersky, a Siberian explorer, who surveyed the watersheds between the rivers Aldan, Indigirka and Kolym, and was with Tchersky when he lost his life.

The old route, and seemingly shorter way across the Omekon and Anadyr rivers, was pronounced impracticable, and it was decided to follow the post route via Verkhoiansk. By descending the Lena and then up the river Aldan, the 153 miles to Tandinsky would be accomplished by steamer in two days, whereas it would take five days by horses to take the short cut across country.

The river Aldan, which is not very imposing on the map, is nearly seven miles wide at its junction with the Lena; some 10 miles higher up it narrows, but even there and for 400 miles higher up it is from three to four miles wide. The Aldan, like the Lena, embraces an immense number of islands, making navigation extremely difficult. 20 miles above its junction the right bank of the Aldan rises from 80 to 200 feet above the river. Tandinsky, the first object of the expedition, is situated 113 miles above the junction of the rivers on the south bank.

At one o'clock on the 22nd of June they crossed the Aldan, and were able to make a start of 27 miles that day, and the real difficulties of a summer journey across country commenced.

The expedition here consisted of the three members, two Cossacks, and three drivers, with twenty horses. The continued rains had made the route almost impossible. Marsh after marsh they struggled through, the horses frequently up to their girths, and some days only covered twenty miles. Especially dangerous was the crossing of the Tookoolan, a rapid river descending from the Verkhoiansk range into the Aldan. The Cossack sent in advance had to wait nine days, waiting for the flood to subside a little, one driver and horse loaded with mail bags being carried away before his eyes and not seen again.

Hertz's head driver took them over about a mile lower down, just above some rapids, when they all got thoroughly wet and had to camp to dry their things.

Beyond the steep Verkhoiansk range the road was a little better, and the last days they accomplished from forty to fifty miles a day, arriving on the 9th July in Verkhoiansk, covering the six hundred and twenty-five miles from Tandinsky in nineteen days.

Here, owing to difficulty in obtaining horses immediately for transport, Hertz decided to go on ahead with one Cossack and some of the baggage, leaving the rest to follow as soon as possible; he was most anxious to get to work at the Mammoth before the heavy frosts set in.

The condition of the country between the Indigirka and Kolym rivers was quite unknown in Verkhoiansk, as no one had come from that district for four months. This gives us an idea of what little communication takes place between these districts during the summer months, and how really difficult it must be to traverse a country which, owing to the melting of the accumulated snow and the torrential rains, can only be likened to one great quagmire; indeed, travellers assert that the great tundra of European Northern Russia, which stretches for some 4,000 miles, with an approximate width of 500, is absolutely impassable during the summer months. For all practical purposes the route from Verkhoiansk to the Kolymsk district had been abandoned for three years already, all communication taking place *via* Ola, on the Sea of Okhotsk, only the post at long intervals being sent by the old route.

The first 400 miles from Verkhoiansk to upper waters of Selegnakh were accomplished in ten days. Continued rain from 1st July made country almost impassable, some days they could only manage seven or eight miles. On the 3rd August reached place called Upravyyi Abyi, with inexpressible difficulty, 113 miles to the west of the Indigirka, and there commenced

such fearful weather that to continue the journey with horses was impossible. After a long search they found a tributary which would carry them to a spot on the Indigirka where they hoped to be able to cross. It took four days to accomplish this journey in six canoes (very small and very narrow). The Indigirka was in such a state of flood that the man in charge of the boats flatly refused to take them over. To judge what a serious obstacle such a river can be, the post, with which a priest was travelling, which had left Yakutsk two months before them, had had to wait for 44 days at that spot for an opportunity to cross. We should be rather sorry to have our letters delayed six weeks by the Exe. One wonders what period is represented by "return of post" in that district.

In the 470 miles from Indigirka to the Kolym met with very few yourtyi encampments (nomads' tents), although the track was very much better. Country was marshy and monotonous in the extreme. The Taiga, as the shrub covered waste is called, was covered with dwarf wood consisting of *Larix dahurica*, mixed with the common white willow and the bush birch. A number of lakes lay in their way, and the road was so monotonous and uninteresting that, as Hertz describes it, they sat silent and apathetic on their horses or mechanically went through the performance of manœuvring the animals through one marshy bit of ground only to flounder into another.

In crossing the Alazeya hills (others designated as ridges), the actual height of which only showed by the aneroid 910 feet, a drifting snowstorm (viuga) came down upon them and lasted four days. In the first two days 4ft. 8in. snow fell. Huddled in their little tent 100 miles from the nearest yourt they were quite snowed up, Hertz adds that he was in despair, for he couldn't help thinking such an early appearance of winter abnormal.

Those who have experienced these fearful snow-drifts will know how unexpectedly and suddenly they seem to cease, and Hertz describes the weather on their arrival in Srednaia Kolymsk as beautiful. It had taken him forty-six days to accomplish 1,340 miles, reaching Kolymsk on the 24th August.

Here he was first able to make enquiries about the object of his journey, and was shown the one tusk in the care of the local police. It weighed 63 English lbs., and was 5ft. 8½in. long, the circumference in the middle being 16½in. The tusk was evidently that of a male Mammoth, but comparison shows us by no means of full size. Professor Owen mentions as the largest tusk that came under his observation one obtained from Ilford 12ft. 6in. in length following the outward curvature, and

Captain Beechey brought home from Eschcholtz Bay one weighing 160lbs. They have been found up to 200lbs. in weight.

Hertz saw the Assistant Overseer Horn, who agreed to guide him to the spot; the Cossack Yavlovsky had gone on there and would not be back for several days.

Hertz decided to descend the Kolym river, 100 miles, to a place called Myisovoy Zaimka, taking six men with him. Owing to the haymaking and fishing season it was very difficult to get the latter, as they wanted 4s. a day and their food, a very high price for labour in Russia, the average general labourer or black workman getting 1s. 6d. or 1s. 8d. a day.

At Myisovoy Zaimka they could await the return of Yavlovsky the Cossack, who would guide them some 100 miles across country to the spot on the Berezovka where the Mamoth had been found, the latter river being quite un-navigable.

Winter fur clothing was almost impossible to obtain, as it was only brought by the natives of the Tchuktchi district for barter when winter communication was established; the only thing was to buy up old furs from the more respectable looking natives of the place for immediate wants; for the rest of the expedition following he ordered things to be ready on their arrival.

Accordingly on the 28th August, with two boats accompanied by Horn, he left Mid Kolymsk. Some twelve miles down the right bank rises to a height of 150 feet, this height continues as far as Lower Kolymsk, while the left shore is quite flat. The first day they reached Zaimka Kooltchinyi, 34 miles. On the 29th westerly wind was so strong they only managed 30 miles. The following day, some seven miles lower down the Kolym, they reached the confluence of the Berezovka, which at that point was 400 metres (say quarter mile), and went on to Zaimka Myisovoy, 150 versts from M. Kolymsk.

At Myisovoy Mr. Hertz learnt that the Cossack Yavlovsky was only expected to return in 34 days from the site of the Mamoth, as he (Hertz) had not been expected to arrive before the winter, only then would he be able to make a start, provided the ten additional horses arrived, for which they had been obliged to send over 80 miles, no more horses obtainable. No further news of the Mamoth could be learnt, as the Cossack and two Yakouts who were then with him were the only people who had seen it.

The Berezovka, the third largest tributary of the Kolym, 470 miles long, winds about in an extraordinary fashion from S. to N. through an impassable tundra. After heavy rains, they told Hertz, an immense quantity of water came down the Berezovka, and as such a flood had recently happened he was very much afraid lest the Mammoth had been disturbed.

The merchants judge of the height of the Berezovka by the fish which at full water are caught in the Kolym, and which at other times are caught only in the Berezovka. These fish they call "Kamennyi" (Stonies), in which Hertz recognised grayling (*Thymallus vulgaris*), two specimens of which he caught at Myisovoy, but does not say whether they were four-pounders.

I hope I have time here for a slight digression. The natural distribution of the grayling is a problem of great interest, the fact that Hertz caught grayling where he did tells us plainly that the Berezovka was then in flood, that it must be a rapid well-aerated stream of water of more than average purity, for the grayling is the most fastidious of fish. Unlike the other salmonidae the grayling rather drops down than ascends against the flood of a stream, but from observation in streams in Finland, I should say, does not descend beyond the particular stony reach of the river they have made their home, and certainly *do not*, as a writer named Bloch, quoted by Yarrell, asserts, descend to the Baltic in the autumn.

This habit of the fish explains what Hertz quotes above as a curious fact. The bed of the Kolym, much slower running than the Berezovka, would doubtless be strewn by boulders and stones brought down by the stream, more especially by the ice floes in the early summer, there can scarcely be said to be a spring. These stones would form a natural habitat for the grayling which would return at the first opportunity to the more suitable waters of the Berezovka. Why the grayling is only found in certain particular spots in certain streams probably only the fish know. It is said *not* to be found anywhere in Ireland or Scotland and, according to Yarrell, in none of the rivers of Dorsetshire, Devonshire or Cornwall. One river I have fished for many years in Finland drains by means of two branches which join five miles from the Gulf, each some 50 miles in length of similar country, the same old glacial moraines cross the two streams transversely, forming ideal spots for the fish. Salmon and salmon-trout ascend both streams without any apparent preference, and yet the western branch contains grayling in some four good places, while we have never been able to obtain a single fish in the eastern branch. Brook-trout

abound in both, fresh water crayfish and everything else that is found in a Finnish stream. The only possible explanation I can imagine is that there is a saw mill up the one stream not inhabited by the grayling, and a flour mill on the other.

But to return to the Kolym. During the six days Hertz was forced to wait there he mentions that the fishermen caught mostly herrings, by which, I think, must be meant the fresh water herring, known to the Russians as Astrakhansky from the fact that they are caught largely and salted at Astrakhan, competing in the Russian markets with the Scotch herring which is a smaller fish. The *Coregonus albula*, known in English as the Vendace or Vendis. Some authorities say there are over 40 varieties of *Coregonus*. In "The Fishes of North America" only 15 are enumerated. A few specimens of *Coregonus nasutus* (Tchir), which were very palatable partly smoked and then hung in the air to dry—

Coregonus omul, very rarely.

Coregonus muksum, more often.

Lota vulgaris (in Russian, Nalim), our burbot or eel pout, caught in the Cam and Ouse, sometimes called the Coney fish from its habit of hiding in holes; this fish is migratory and is caught largely by Russian fishermen in the early spring under the ice. From experience, I can add, excellent for making fish soup.

The fishermen complained to Hertz of the poor catches they were making, owing to which he was unable to take any Ukoloo (dried fish) with him. On his return he found that a number of dogs had had to be killed owing to the scarcity of fish, their chief means of subsistence in the winter.

From the 31st August they noticed flocks of geese flying south, a sure sign of severe weather. First come the doubles and snipe, then the cranes flying in ribbons, then the ducks in triangular regiments, followed by lines of geese, and, lastly, in lesser numbers, the swans, returning in the spring in the reverse order.

On the right bank of the Kolym, opposite Myisovoy, Hertz found a large quantity of bones of mamoth, fragments of bones of rhinoceros, bison, reindeer, and a few fossilized teeth of the horse, all these bones were, however, badly preserved.

At last, on 3rd September, Cossack Yavlovsky turned up, and Hertz learnt the story of the finding of the Mamoth from him as follows, of which I will give a literal translation. The tale he brought was not encouraging. He had intended to

hurry off there in the spring in order to cover the exposed parts of the body for protection against the rains and carnivorous creatures. Unfortunately he was taken seriously ill, and had only just been able to visit the spot. Consequently he found on arrival that a large quantity of the earth had been carried away by melting snow and rain. A good deal of flesh was torn from the back, the spine was all exposed, and the head gnawed by bears and wolves. Yavlovsky collected the scattered and torn pieces and covered all with earth and stones.

The Lamoot Tarabiken following reindeer, found in August 1900, a little higher than the body of the Mammoth, the "beeven" (tusk) of another mammoth weighing ($166\frac{1}{2}$ English lbs.) poods 4.25 funts, after which Tarabiken, looking about, found the head of our Mammoth protruding from the earth, on which, however, he noticed only one tusk. The head was well preserved, and Tarabiken in consequence of the superstitious fear the Lamoots entertain of the Mammoth corpse, from the disinterment of which one is sure to be visited by sickness, went off to his encampment 20 versts away, and told the Lamoots Michael Taptchin and Vasili Detkoff. Both these Lamoots visited me twice on the site of the finding of the Mammoth, and after much questioning, I ascertained that already, when found, the covering of the head was partly decomposed, and the trunk (or nose as the Lamoot called it) was missing. The day after the discovery, when the three Lamoots together visited the spot and removed the left trunk, there was already, according to my two informants, nothing of the head covering left but a small portion of hide round the socket of the tusk they cut out.

The Lamoots suppose that the head must have become bared already the previous year, but they assure me that it could not have been noticed, as they were quite sure they were the first to visit the spot, and had never in their lives seen a mammoth before. It should be here mentioned that the Lamoot Taptchin was already over 90 years old.

Hertz regrets that he was unable to see the third Lamoot, the actual discoverer of the Mammoth, Tarabiken, who was at that time away on the upper waters of the river Omolon, on the other side of the Kolymsk mountains.

At the end of August all three Lamoots left for the Kolym, where they sold Yavlovsky both tusks, informing him that the smaller one weighing P. 1-30, had been taken from a different mammoth lying in the ground in good preservation, which they hadn't dared to touch.

The Cossack, an intelligent fellow, understanding the importance of the find, arranged to meet them on the 1st November, so that they could go together to the spot. He further told the Lamoots that, if it was really as they said, he would inform the Emperor, who would very likely send an expedition to bring the whole carcase to St. Petersburg.

It was a pity that Yavlovsky did not arrange with the Lamoots to cover the body properly. However he took pieces of the hide, and part of the contents of the stomach, and with the tusk proceeded to the Police department in Mid Kolymsk, and laid the matter before the Assistant Superintendent of the district, Nicolai Leopoldovitch Horn. Horn decided that he must convince himself of such an important find, and then inform the Governor of Yakutsk. The above mentioned parts of the Mamoth (except the tusk) he despatched to the Imperial Academy in St. Petersburg, which had not arrived when Hertz left.

Accordingly Horn, accompanied by the Cossack, in the middle of December 1900 visited the Mamoth, and then reported the find to the Governor of Yakutsk, who in his turn sent information to St. Petersburg.

To continue the narrative of the expedition. On the 5th September, after crossing to the right bank of the Kolym, as the horses had only arrived the day before, they were not able to go far, but started due south in the direction of the Plate Mountain, which Hertz judged to be about 1,500 feet high—so called because it partly resembles an inverted plate. They crossed the tundra very slowly and made only 12 versts (eight miles) before camping for the night.

September 6th. Continued our journey south to Plate Mountain, which lies 20 versts to the east of the river Kolym, where we first surmounted a height 1,120 feet, and then a still higher one 1,365 feet, forming the Eastern spur of Plate Mountain, consequently not much lower than the highest point. The Taiga, east of the Kolym river, over which we passed, had long since been burnt without creating the customary undergrowth. Everywhere burnt stumps obstructed our route, which was most difficult for our pack horses. On the higher parts of the mountain-side grow alnus bushes and *pinus cembra pumilo* (Siberian cedar) the fruit of which grows to a very small size and is unedible.

Having crossed the last ridge we went down a narrow valley in which a wood of *larix dahurica* was rather thick. We noticed also the dwarf birch (*betula nana*) and alder bushes.

This valley stretched for 20 versts to the south, and at the end of it, on the shore of a small lake, we stopped for our second night's encampment, having accomplished 40 versts.

7th September. In a thick snowdrift, most difficult to proceed in, as the horses, although only carrying 1 cwt. each, were every minute falling, we crossed two ridges, 1,055ft. and 1,285ft., and after 30 versts reached the river Sievera. We crossed it on horseback, and, after travelling three versts along the bank of the Berezovka, encamped.

In a narrow valley, leading from the last hill to the Berezovka, we noticed, besides the larch and dwarf birch,—latter with stems no thicker than a man's fist, and only in valley and sheltered places,—*populus suaveolens* and two sorts of salix (willow family), a variety of *balsamifera* more fragrant than any other form of the species. Judging by an old trunk with a diameter of only 19 inches the *populus suaveolens* does not find conditions favourable to growth.

It was already quite dark when we reached the Berezovka, and the snowstorm increasing we soon put up our three little tents, covered the baggage, and as we were wet through did not think of preparing supper, but swallowing several glasses of hot tea soon sought the shelter of our tents.

8th September. After the snowfall the Berezovka had risen so high that we daren't try to cross and were obliged to wait until the next day. The width was about 200 yards and the stream rapid. We couldn't ascertain the formation of the banks. I examined the shore, covered with pebbles to a depth of from 10 to 13 metres, and collected several fossils.

9th September. We got the baggage across on the strongest of the horses, finally got everything over without accident, and after covering another 40 versts reached the goal of our journey. This part of the journey was performed solely by the aid of the compass as they couldn't see any landmarks for the snow. Although very late when they once more struck the river, we can understand with what eagerness Hertz, guided by Horn, found his way to the spot he had been travelling over four months to reach.

And now the task of packing and transporting to the railway the huge creature lay before him. If not accomplished before the spring he would have to wait until the following winter. How to dry and preserve with salt and alum that huge hide, and dissect the monster into portable lumps?

Passing over Hertz's speculations as to the best way to accomplish his task.

On the 10th September the snow storm continued the whole day; they occupied themselves with felling trees for a log hut in which they would have to spend possibly a couple of months.

11th September he describes as being quite a warm day, 4° Reaumur, at least the surface of the ground slightly thawed and they were able to accomplish some preliminary work. He photographed the site, and I will here give you an exact translation of the description of the site, only transferring his measurements in metres into English equivalents.

The body of the Mammoth lies at a distance of about 600 yards from our encampment and about 114 feet above the present level of the water in the Berezovka, and on the left shore. The body lies on a landslip one mile in length facing the east in the form of a half circle. The debris of the landslip slopes at an angle of 35° from the top strata of earth, on which rests the tundra, to the shore of the Berezovka. The surface of the landslip has a width of 122 yards, its mean height being about 180 feet. The Mammoth's body lies 67 yards from the river.

The upper layer of earth covered with moss measured in several places was from 12in. to 20in. thick. Under this lies about $6\frac{1}{2}$ ft. of clay and earth, in which lie stones, roots, and pieces of trees in parts even twice that thickness. Over the whole a covering of ice 6in. to 7in. thick. Under this alluvial deposit comes to light a vertical wall of ice, standing free above the spot where the Mammoth was found in parts 17ft., in others over 23ft. This ice wall probably goes under to the river shore at the same angle as the rest of the landslip. I hope later to examine this wall.

Over this supposed glacial incline lie immense masses of earth and hillocks of debris, slipping during the heavy rains owing to the gradual thawing of the ice wall, and also to the water percolating from the upper tundra and from the hill ridge 390ft. high lying behind, about 300 yards from the river. Owing to such a slip or the disintegration of a quantity of earth, in the opinion of the Lamoots already two years ago the head of the Mammoth must have been disclosed, while the rest of the body was only freed at the end of August, 1900.

Having photographed the situation, Hertz proceeded to examine the protruding head, and to his astonishment found between the teeth well preserved remains of food, which proves the sudden and, I may say, unexpected death of the animal.

The axe marks were noticeable on the socket of the left tusk, and Hertz was able to identify by careful measurements he had made, the socket, as without doubt that from which the smaller of the two tusks brought by the Lamoots to Kolymsk had been extracted. The right tusk had been long lost, and there were no signs that it had been taken since the discovery of the Mamoth. The lower jaw, firmly imbedded in the ground, rested on a large piece of hide, which was found afterwards to be the upper part of the chest.

Proceeding to excavate at the head at the depth of 27in. they came upon the left front leg covered still on all sides to the shoulder with hair. The epidermis, the outside part of the hide, was quite rotten, but the wool still clung to the hide with the help of the damp earth.

The covering on the upper part of the left front leg consisted of a yellowish clotted under wool from 10in. to 12in. long, with thick bristles, this hair thickly matted is from 4in. to 5in. at the ends of a rusty colour.

This leg was bent in such a manner as to show plainly how the creature had struggled to get out of the hole or crevasse into which it had probably fallen, but it was evident that it had been so severely wounded in falling that it was quite impossible to free itself. Right leg was also in a horizontal position, with very little hair. The stench unbearable and transmitted to hands took a lot of washing off,—later on describes stench as being noticeable a mile off, largely due to gases, as after a time it became much less.

Hair under the legs of a roan colour. Under wool more the colour of a camel's summer coat.

The feet had five blunt toes which form the peculiarity of the elephant's hoof or foot.

The hair was less and shorter on hind legs than front.

Hertz mentions the absence of much hair on the sides of the animal, as also on surface of right leg, explains this by ice and earth slipping and scraping down to a lower level removing the hair.

From the standing position of the animal we can conclude that he was discovered in the exact position that death found it, that the catastrophe occurred on this spot and that the body had not been carried by flood. The thick covering of hair shows capability of withstanding cold climate. The young of the Asiatic elephant are to this day born with a covering of hair which they afterwards lose. In the Zoological Gardens at Basle (Bâle) there is an elephant with such a thick growth of hair that at the Congress of Zoologists held at Berne in August 1904, the remark was made—of course in jest—that the animal was really a mammoth. The Asiatic elephant is rather a cousin than a descendant of the Mammoth. The African elephant belonging to another stock, the *Stegodon*.

The head of the Mammoth faced south. It had evidently not died of starvation. Everywhere about lay bones of reindeer and broken pieces of bone of the short horned stag. They could find no sign of missing trunk which had evidently long since decomposed or been eaten by wolves, made most careful search but only found about six feet to the south of right socket part of the skull of a reindeer. A curious find in removing the earth to get at hind legs was the end of a bison's tail thickly covered with hair.

Hertz made a careful collection of the flora of the tundra for comparison with the remains of food taken from the mouth and stomach of the Mammoth. When I last visited the Museum some nine months ago, the mass of what looked like very coarse dried grass, no less than 27 lbs. of which were taken from the stomach of the Mammoth and preserved in spirit, had been removed from the cases, I concluded, for careful examination.

Although I have sent twice to St. Petersburg, and a friend called upon Professor Hertz and obtained photographs for me, I have been unable to get any description of the food found in the animal. I cannot help thinking that every particle will be most carefully examined and probably a full report given of such an interesting subject. Hertz notes that the food consists only of grasses, no pine needles or leaves being noticeable.

Hertz came to the conclusion from an examination of the pit out of which they dug the Mammoth that the creature must have fallen with great violence into a crevasse in a glacier, breaking the pelvis, right shoulder blade broken across centre, and other bones; several ribs were afterwards found to be broken. He also concluded from finding solid glacial ice under the animal which he excavated for 7 feet, that the remnants of the glacier extend right under the bed of the Berezovka, in other words that the river flows on its surface.

On the 20th September, Pfitzenmeyer the taxidermist arrived with the remaining transport. The geologist, much to the annoyance of the leader of the expedition, had gone back to Srednaia Kolymsk, as he came to the conclusion that owing to the quantity of snow about, he could not make any geological investigations until the following spring. They caught every day fish from under the ice, but could catch nothing but pike. Difficulty of work was much increased by having to thaw every part of the animal before dissection. I have made a list of the temperatures recorded (see appendix). The meat under the shoulder he describes as of a dark red colour, as fresh looking as freshly frozen beef or horse flesh. They couldn't persuade themselves, however, to try to eat it. The dogs eagerly devoured it.

The hide of the left shoulder was about $\frac{3}{4}$ in. thick, that on the right side thicker about $\frac{7}{8}$ in. Hair on chest was as much as 20in. long. The longest hair however was on the shoulders. This formerly led to the mistake being made that the Mammoth had a mane. A curious fact about the bristles was that they retained their elasticity in the frost, but on being brought into the warmth of the hut became immediately brittle. The separate parts were first enveloped in bandages, then in hay, covered with sacking, and when they reached Kolymsk, each bundle was stitched up in leather. Blood between the stomach and chest bone felt like coarse sand, when wetted left a dirty dark red stain, that from above chest and shoulder-bones was light yellow clay colour, and felt like lime.

Length of tail 14in., with tuft of hair 8in. to 10in. in length, Hertz says in his diary 22 to 25 vertebræ. In the reconstructed skeleton, however, I only could count 21. In the Lena Mammoth, reconstructed by von Brandt, there are 26 caudal vertebræ. The latter must be at fault, I think, for an expert zoologist like Hertz would be very particular in such matters. Certainly a discrepancy exists, for I also counted 19 trunk vertebræ in the Lena and 18 in the Berezovka Mammoth.

On the 11th October they finished dissecting the creature, and as no fresh snow had fallen for some time the Cossack had been sent ten days before to ascertain the best road. Ten sleighs were packed when the Cossack returned on the 14th, so on the 15th October Hertz sent them off in his charge, and followed himself on the 22nd.

Besides the Mammoth, in the 27 cases brought home, some 100 specimens of rodents, 150 birds, 5,000 insects and 50 fish; samples of earth and sand; remains of a plant found under the

left hind haunch of the Mammoth. Unfortunately I have been unable to obtain any detailed report of these specimens or the result of the geological investigation of the following summer. The geologist remained behind in Kolymsk for that purpose.

In spite of all haste they were unable to get the first contingent ready to leave Kolymsk before the 15th November, Hertz following himself with the second half on the 26th. It was most important that they should accomplish the journey over the taiga during the winter, and day and night they travelled for 2,000 miles to reach Yakutsk, only making one short stop at Verkhoiansk, the coldest astronomically calculated spot on earth.

From Andylacha *via* Verkhoiansk to Aldan, about 1340 miles, only reindeer were used, being much quicker over the snow than horses. The temperature at times descended to 50° Reaumur (80° Fahrenheit of frost, or 48° below zero), 8° below the freezing point of mercury. (The greatest natural cold ever recorded is, I believe, 68° below zero F.)

It is not surprising that their faces were occasionally frost-bitten. Hertz found the continual sitting on a reindeer sleigh most fatiguing. There was either too much or too little snow; owing to the intense cold the snow would be very powdery, and easily drifted by the wind. The reindeer became terribly exhausted in crossing the Verkoiansk ridge, especially in the descent where the sleighs were frequently broken, and what was worse, several of the reindeer broke their legs. Those who have ever driven in such regions across country where there is no road in an open sleigh, will know how easy it is to get overturned by a hidden tree stump, or the unevenness of the ground. Owing to one of these spills, the bale containing the tongue and remains of food from the Mammoth was nearly lost. The leader of the expedition fortunately had adopted the expedient of bringing up the rear on the last sleigh, and noticed the black object in the snow. We can imagine with what anxiety after that he scanned the tracks as he went along.

He once more mentions in the Tookoolan district the magnificent forests of larch and poplar (*larix dahurica* and *populus suaveolens*) growing to the height of 200 feet, only between 3 and 4° further south than the spot near the Berezovka where they were so stunted. They passed two Cossacks struggling along with heavy post transport. The greater number of sleighs they had temporarily abandoned on the other side of the ridge, and the expedition passed the overturned sleighs with their contents scattered about in the snow, one

box with photographic appliances, and many others being broken open. The natives are extraordinarily honest, never being known to steal or even touch anything that didn't belong to them.

From Yakutsk to Irkutsk they travelled day and night with horses, accomplishing the 1870 miles in 16 days. Leaving Irkutsk on the 6th February they reached St. Petersburg with the Mammoth on the 18th, having been away a little less than ten months, and travelling, besides railway and boat, some 4000 miles by sleigh and 2000 miles on horseback.

With the return to St. Petersburg I must bring my paper to a close.

In the Yakutsk language the Mammoth is called Ookyila (water monster); in the Lamoot dialect, Agdian Kaymyi (big monster). The word mammoth is supposed to be of Tartar origin, in Russian, *mamont*, and therefore is incorrectly spelt according to the dictionary custom with two "m's." The error doubtless crept in from confusion with the word "mammal," of quite different origin.

For the benefit of visitors to St. Petersburg I should add that an interview with the Berezovka Mammoth is not easily obtained. An inexplicable, stupid arrangement of the powers that be causes the Museum, the excellent collection of the School of Mines, and much else that is worth seeing, to be closed from the 1st May to the 1st September, in addition to the many holidays and Saints' days which occur during the winter. The professors, with their pupils, undertake scientific expeditions all over the country, but it is more than unfortunate that just at a time when so many tourists visit St. Petersburg, and so many teachers and scholars from other parts of Russia are at liberty to visit and examine what are really good collections, everything is closed.

In conclusion, I will express the hope that if any present here this evening are encouraged to visit St. Petersburg, they will find a different state of things than at present exists in that unhappy country.

TEMPERATURE RECORDED DURING WORK OF EXCAVATING
AND DISSECTING THE MAMOTH.

		Degrees.		Degrees.		Degrees.
September	10	8 a.m. — 3·3	Noon	+ 1·5	7 p.m.	— 1
"	11	" — 2	"	+ 4	"	+ 0·5
"	12	" — 4	"	+ 1	"	— 3·5
"	13	" — 8·5	"	+ 0·5	"	— 5
"	14	" — 8·5	"	+ 1	"	— 2
"	15	" — 2	"	+ 2·5	"	— 3·5
"	16	" — 4	"	+ 4	"	— 7·5
"	17	" — 6	"	+ 3	"	— 1·5
"	18	" — 6·5	"	— 2	"	— 5
"	19	" — 3	<i>Highest</i> + 4 (41 °F. 9° of warmth)			— 3·5
"	20					
"	21	" — 2·5	"	0	"	+ 1·5
"	22	" — 5·5	"	— 1·5	"	— 4
"	23	" — 5·5	"	— 1	"	— 6·5
"	24	" — 5	"	+ 0·5	"	— 3·5
"	25	" — 5·5	"	+ 1	"	— 6·5
"	26	" — 6·5	"	— 1	"	— 7
"	27	" — 7·5	"	— 2	"	— 6
"	28	" — 7	"	— 4·5	"	— 7
"	29	" — 12	"	— 3·5	"	— 7·5
"	30	" — 9	"	— 3·5	"	— 6·5
October	1	" — 8·5	"	— 2·5	"	— 7·5
"	2	" — 12·5	"	— 2	"	— 6·5
"	3	" — 6·5	"	— 2	"	— 7
"	4	" — 10	"	— 6·5	"	— 17
"	5	" — 15	"	— 10·5	"	— 18
"	6	<i>Lowest</i> — 18 (8½° below Zero F.)	"	— 10	"	— 11
"	7	" — 9·5	"	— 7	"	— 12
"	8	" — 12	"	— 7	"	— 8·5
"	9	" — 9	"	— 6·5	"	— 13·5
"	10	" — 17	"	— 10·5	"	— 15
"	11	" — 13·5	"	— 6·5	"	— 7

On 11 days out of 32 temperature at midday stood above the freezing point —.

LOCKED
CASE

